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Current Challenges Implementing E-Government

Does E-Government Measure Up to E-Business? Comparing End User Perceptions of U.S. Federal Government and E-Business Web Sites

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This paper examines the federal government's success in implementing and providing high-quality service through e-government, something that has received very little attention. We define quality from the perspective of the end users of federal agency Web sites, as measured through customer survey data. Using data from the American Customer Satisfaction Index, we compare the performance of federal agency Web sites across a range of relevant variables with a private sector equivalent, e-business Web sites. Our findings suggest that federal e-government Web sites are not yet, in the aggregate, providing the same level of quality as their e-business counterparts. We also find significant variability among federal agencies. We discuss the implications of these findings for e-government performance measurement, performance benchmarking, and the market-centered theories of administrative reform that are driving e-government and similar transformations of government practice.

The U.S. federal government has integrated electronic government, or e-government, into a large proportion of its interactions with citizens. The emergence and growth of e-government is attributable to both the piecemeal diffusion of information technology (IT) across individual agencies and to legislation such as the Clinger-Cohen Act (also called the Information Technology Management Reform Act of 1996) and the Act of 2002 (EGA, P.L. 107-347), which have accelerated the adoption of IT at the federal level (Holmes 2006). Indeed, the EGA identifies e-government as the channel through which most, if not all, federal government services will soon be offered, underlining the importance of e-government to the future of government service delivery. The primary justification for the move toward e-government, an electronic channel of service delivery that has proven tremendously successful in the private sector (Agarwal and Venkatesh 2002; Barua and Mukhopadhyay 2000; Brynjolfsson and Hitt 2000; Kauffman and Walden 2001; Liang and Tanniru 2006–7; Lucas 2008; Rai and Sambamurthy 2006; Rust and Kannan 2003), is the belief that it holds considerable potential for positively transforming government service delivery in a manner that is consistent with recent market-centered theories of public sector reform (see Chadwick and May 2003 for an excellent review).

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However, there are reasons to believe that government may not always be successful in implementing practices that are otherwise commonplace in the private sector. This is particularly the case if performance is poorly measured or there is no pressure to improve performance. The differences in the nature of ownership structures between government and commercial organizations may lead to a distinct set of objectives (Ring and Perry 1985). Compared to commercial firms that focus on the maximization of profits for private owners, government organizations respond to society as a whole and are expected to maximize social utility. Factors such as policy ambiguity, transparency requirements, customer diversity, and time constraints can contribute to decision-making differences between government and commercial organizations (Ring and Perry 1985) and affect information management and communication policies (Hoos 1971). Caudle, Gorr, and Newcomer (1991) show that the public sector has multiple, conflicting, and intangible goals that make managing information systems in the public sector different from managing those in the commercial sector. Indeed, focusing specifically on the New Public Management movement

(discussed later), Dunleavy et al. (2005) suggest that a shift away from private sector–inspired reforms has begun in governments across the globe, a change in perspective spawned by the failure of many of these reforms to yield the desired effects. For all of these reasons, whether the use of IT-enabled transformations such as e-government has resulted in the sought-after benefits, similar to those one might expect based on the outcomes in the private sector (Mithas, Krishnan, and Fornell 2005; Mithas et al. 2006–7), is ultimately an empirical question.

The goal of this paper is to assess the success of the federal government's implementation of e-government, a concept that is often defined broadly as the application of any new information technology to government service delivery, but which is defined here more narrowly as the government's use of Web sites to interact with and deliver services to citizens (Chadwick and May 2003; Gasco 2003; Roy 2003; Thomas and Streib 2003). We focus on the success of federal agencies and departments in providing high-quality services to their customers through e-government Web sites. The ideal of success chosen here is defined from the perspective of the end users and consumers of these Web sites, perceptions that are measured through survey data that have significant associations with objective measures of performance (Fornell, Mithas, and Morgeson, forthcoming; Fornell et al. 2006; Tallon, Kraemer, and Gurbaxani 2000). The method adopted for determining the success (or perhaps lack thereof) of federal e-government performance in providing high-quality services is the comparative method, with mean values across a range of relevant variables for federal agency Web sites compared to a private sector equivalent, e-business Web sites.

Our findings suggest that federal e-government Web sites are not yet, in the aggregate, providing the same level of quality as their e-business counterparts. We find evidence for significant variability among individual federal agency Web sites. We note how these findings underline the importance of e-government performance measurement within agencies and suggest strategies for performance benchmarking. Because federal government accounts for a significant amount of IT expenditures, more than $60 billion a year, this study offers important evidence for assessing the extent to which federal government has successfully deployed IT systems in its customer interface.

E-Government and the Promise of Performance

E-Government and Market-Centered Theories of Public Sector Reform

Electronic government has been argued to reflect a "new face of government," one that is transforming government–citizen interactions at all levels of government and within governments around the globe, and one that is very likely to grow even more influential in the future (Chadwick and May 2003; Edmiston 2003; Gasco 2003; Roy 2003; Thomas and Streib 2003). In the United States over the last few years, the federal government has integrated e-government into a majority of its interactions with citizens; the range of services (e-services) that citizens can now receive from the federal government through the Internet is nearly comprehensive. Furthermore, recognizing the growing importance of the Internet as an emerging innovation in government service delivery, but also noticing the relatively slow development of agency Web sites across the federal bureaucracy, in 2002 Congress passed and President George W. Bush signed into law the E-Government Act of 2002. As this statute declares, the EGA was founded on the dual insights that "the use of computers and the Internet is rapidly transforming societal interactions and the relationships among citizens, private businesses, and Government," but that "the Federal Government has had uneven success in applying advances in information technology." The EGA thus provides centralized leadership (through a new Office of Electronic Government), as well as some funding, to a federal initiative aimed at creating a comprehensive and unified electronic infrastructure capable of integrating information technology, and especially a system of federal agency Web sites, into virtually all of the activities of the federal government.

But why has this IT-enabled innovation (i.e., e-government) been adopted as the preferred channel of government service delivery at the federal level? The EGA provides several answers to this question, and while the stated objectives driving this legislation are numerous, when viewed in its entirety, the overarching purpose of this statute is to adopt a *best practice of the private sector with the goal of transforming federal government,* with two concurrent objectives in sight. First, a central goal of the EGA is to create, through e-government, a federal government that provides *high-quality services to citizens,* a "citizen-centric" government that is recognized to provide more satisfying experiences, and a government that is worthy of citizens' trust. Second, the EGA also hopes to realize *cost savings* through a variety of efficiency enhancements associated with e-government, and particularly more efficient communication between citizens and government, between businesses and government, and intergovernmentally. As President Bush declared in a statement announcing the new law, "the Act will also assist in expanding the use of the Internet and computer resources in order to deliver Government services… for a *citizen-centered, results-oriented, and market-based Government*" Bush 2002; emphasis added).

When understood as a reform aimed at both improved customer service and cost savings through innovations borrowed from the private sector, the move toward e-government can be recognized as part of a broader trend in public administration reform that emphasizes the ability of the public sector to overcome many, if not most, of its perceived deficiencies through the adoption of private sector best practices. Typically subsumed under the label New Public Management (Jones and Thompson 1999; Kaboolian 1998; Kettl 2000), this movement and its proponents have emphasized a handful of transformations to the public sector as most essential, including more decentralized, flexible, and entrepreneurial types of agency management; a government-wide orientation to customer service delivery; the setting of performance goals and mandatory performance measurement—as well as related private sector practices, such as "performance benchmarking"—as means of monitoring service quality; and the adoption of private sector practices wherever possible as means to all of these ends, with a strong emphasis on the adoption of private sector IT (Box 1999; Jones and Thompson 1999; Kaboolian 1998; Kettl 2000). The purpose of these reforms for advocates of New Public Management is straightforward: Government can provide better service to citizens if it better understands the "large area of overlap between business and public management" (Jones and Thompson 1999, 2). Peters identifies these types of public sector reforms, and especially their emphasis on the marketplace as the most important terrain for discovering new directions, as "the dominant idea for [administrative] changes adopted during the past two decades" (2001, 349). It seems unnecessary to look further than this reform tradition to identify the ultimate inspiration behind the movement toward e-government at the federal level.

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Research Questions

If e-government is the medium that the federal government has chosen as the preferred channel for delivering services to and interacting with citizens in the future, and if this best practice has been chosen because of a promise of improved federal government performance, several important questions remain unanswered. Indeed, almost no research has investigated the success of the federal government in providing high-quality services through e-government (or what has been termed "user-centered" e-government; see Bertot and Jaeger 2006), particularly from the customer perspective (Tolbert and Mossberger 2006; West 2004), and even less research has compared e-government with private sector equivalents (Escher and Margetts 2007; Lake 2006; Scholl 2006). Focusing specifically on the prospects for and the progress in improved performance as high-quality customer service through e-government, the remainder of this article will seek answers to a few of these unanswered questions.

The first and primary research question concerns the progress of the federal government in implementing e-government, such that this technological innovation has in fact helped realize the underlying goal driving these innovations. Stated differently, this question asks, how successful has the federal government been in providing high-quality services to citizens through e-government, service comparable to the free market private sector, and thus in providing the more citizen-centric type of government promised in the theories of public sector reform that are driving the decision to adopt e-government?

We also ask several complementary questions: What can this study tell us about the importance of performance measurement of agency Web sites, particularly as the federal government moves aggressively toward e-government as the primary means for delivering services to citizens? Connected to this, what is the appropriate level of comparative analysis for e-government Web sites when conducting performance benchmarking, a practice that is becoming commonplace at all levels of government? (Kouzmin et al. 1999). And finally, what can the federal government's success in implementing e-government tell us about the theories of administrative reform that have emphasized the transformation of the public sector through the adoption of private sector practices? That is, does the evidence from the federal government's implementation of e-government support or undermine the basic premises of these market-centered perspectives on public sector reform?

To answer these questions, we adopt the *perceptions of end users* of federal government Web sites as the metric of the federal government's success in delivering high-quality customer service through e-government. These data (described in greater detail later) will provide insights into the quality of the services offered through these Web sites from the perspective of the final and inarguably most important judges of Web site quality, the actual consumers.

Moreover, the method we will employ to analyze these data is one that is suggested by the market-centered theories of administrative reform discussed earlier. Put simply, as e-government is recommended as a means for transforming government practice because of its success as applied in the private sector, a reasonable test for determining the federal government's e-government performance is to adopt the comparative method and contrast end user perceptions of federal e-government Web sites with consumer perceptions of the closest private sector equivalent, e-business Web sites.[1] E-business Web sites should not be confused with *e-commerce* Web sites, where some type of economic transaction is central to the interaction. Very much like e-government, the most basic purpose of e-business Web sites is the *search for and dissemination of information,* and thus these Web sites can be fairly compared to federal e-government Web sites. Given the fact that e-business (as defined here) is devoted to information provision and that a significant majority of citizens report their reason for visiting an e-government Web site as a search for information—Thomas and Streib (2003) report that 64 percent of the respondents in their survey visited a government Web site solely to seek information—we suggest this approach can be very useful. Indeed, government IT systems in many countries are designed and maintained by private sector service providers, underlining the interconnectedness of these two domains (Dunleavy et al. 2007). Further, our approach is consistent with prior work that uses private sector service quality as a benchmark for public sector service quality (Poister and Henry 1994).[2]

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Methodology

Data

The data examined in this analysis come from two separate sources. The first data set comprises customer surveys of end user perceptions of individually measured e-business Web sites included within the American Customer Satisfaction Index (ACSI) e-business sector.[3] These data were collected through the National Quality Research Center (NQRC) at the University of Michigan. The second data set comprises customer surveys of end user perceptions of individually measured federal e-government Web sites. These data were collected by ForeSee Results, Inc., a partner of the NQRC that is responsible for the e-government portion of the ACSI project and a cosponsor of both the ACSI e-business and e-commerce studies.

The e-business ACSI sector includes 10 Web sites in two central categories in the e-business domain: portals and search engines, and news and information Web sites. Chosen on the basis of market share (or page traffic), and representing some of the most popular Web sites in the American (and global) marketplace, the Web sites included in these two categories are Yahoo.com, AOL.com, MSN.com, Google.com, Ask.com, CNN.com, USAToday.com, ABCNEWS.com, MSNBC.com, and NYTimes.com. Approximately 250 interviews were collected for each individual Web site, resulting in a total sample of $N = 2{,}501$. The data were collected during the second quarter (April–June) of 2006.

Like the e-business sample, the e-government sample includes customers of 10 federal agency Web sites. These Web sites were chosen for this study from a larger sample of measured Web sites because of their traffic, importance, and representativeness, with included Web sites representative of agencies delivering benefits, providing services, and performing regulatory functions. These agency Web sites are the Bureau of Labor Statistics (BLS.com), the Food and Drug Administration (FDA.gov), the federal government's FirstGov portal (FirstGov.gov), the Department of Agriculture (USDA.gov), the Department of Education's ERIC Web site (ERIC.ed.gov), the Department of the Treasury's Office of the Comptroller of the Currency Web site (occ.treas.gov), the Department of Justice's Office of Community Oriented Policing Services Web site (cops.usdoj.gov), the Food Safety and Inspection Service (FSIS.gov), the National Institutes of Health Center for Information Technology Web site (CIT.nih.gov), and the Social Security Administration (SSA.gov). Interviews were collected by ForeSee Results continually during the same April–June period with no ceiling for completed interviews, and thus all but one of the Web sites had well over 250 completed interviews. For purposes of comparison, and to minimize the bias that could be introduced by allowing for excess sample from any one particular agency, 250 cases were selected randomly from each total agency sample to produce a sample roughly equal in size to the e-business sample. For this sample, $N = 2{,}324$.

A small number of the variables measured within these two studies are sector specific, seeking end user attitudes that are unique to either e-business or e-government Web sites (or to the particular agency Web site measured), and thus do not allow for meaningful comparison. However, most of the variables measured were identical (or very nearly so) in intent and question wording, facilitating the cross-sector comparisons necessary to answer the research questions posed earlier.

We examine nine variables common to these two studies. These variables can be divided into three categories, corresponding to the statistical models for which the data were originally collected. The first group is made up of *determinants of customer satisfaction* (variables 1–4), variables that tap into consumer perceptions of the actual functionality of the measured e-government and e-business Web sites (i.e., various dimensions of the services offered). The second group includes various *measures of customer satisfaction* (variables 5–7), items that are focused on the affective dimension and the respondent's overall happiness with the Web site experience. The last group of variables is made up of *predicted future behaviors* (variables 8–9), the desired outcomes or consequences of end user satisfaction. A description of these questions, including question wording and response scales for each variable, is provided in table 1.

Statistical Analysis and Findings

To compare the e-business and e-government ACSI data, we performed several statistical tests.[4] First, we used the independent samples *t* test to compare the mean values of all of the variables across the two groups of Web site users. This test was chosen because the independent samples *t* is the most regularly used statistical test for comparing mean values of interval-level variables across two groups of subjects when the two samples can be deemed independent of one another (Sheskin 2004). Critical values from two-tailed tests are used for all of the comparisons, because while we are testing hypotheses that could accommodate one-tailed tests, significant differences between the two samples in either direction—with e-government lower or higher than e-business on any of the variables—are also of interest. Table 2 presents the results from these *t* tests, as well as relevant descriptive statistics.

The raw, absolute differences between the two groups of Web site consumers across the nine variables range from a low of 0.125 (for the confirmation to expectations question) to a high of 0.754 (for the overall satisfaction question). The independent samples *t* tests reveal significant differences between the perceptions of e-government and e-business Web site users on almost all of the variables—for eight of the nine variables, to be precise (assuming a standard level of significance sufficient to reject the null hypothesis, or $p < .05$). For six of the eight variables for which significantly different mean values were found, the difference favors e-business Web sites. That is, in rating their experience with their e-business Web site, respondents were inclined to rate more favorably the customization (or personal fitness for use) of the Web site, the organization of the Web site, the ease of navigation of the Web site, the reliability of the Web site, overall satisfaction with the Web site, and the Web site's proximity to an ideal compared to their e-government counterparts.

Focusing on this group of variables, the evidence suggests that the federal government still has some way to go in providing Web site functionality that is viewed as favorably by their customers as that provided to the customers of e-business Web sites. Federal e-government Web sites are perceived by their own customers as less customizable, less well organized, less easy to navigate and less reliable—all perceptions that, when considered together, are indicative of a system of federal e-government Web sites that is not delivering services of the same quality as those provided by private sector e-business Web sites. Furthermore, extending on this "functionality gap," and indeed as a logical consequence thereof, federal e-government customers are not as satisfied with their experiences as customers of e-business Web sites, at least according to two of the three satisfaction variables (with the third satisfaction variable discussed later). This evidence allows us to answer our first research question, and to conclude that the federal government has yet to offer Web sites that deliver high-quality services, at least relative to a reasonable equivalent, private sector e-business Web sites.

Table 1 Question Wording and Response Scale*

Question Wording, (Short name)	Min	Max
1 How well has the website met your personal requirements/allowed you to accomplish what you wanted to? (Customization)	1	10
2 How well organized is the website? (Organization)	1	10
3 How easy is the website to navigate? (Navigation)	1	10
4 How reliable is the website? (Reliability)	1	10
5 Considering all of your experiences, how satisfied are you with the website? (Overall Satisfaction)	1	10
6 To what extent has this website fallen short of or exceeded your expectations? (Confirmation to Expectations)	1	10
7 Imagine an ideal website. How well do you think this website compares to that ideal site? (Comparison to Ideal)	1	10
8 How likely are you to return to this website? (Retention)	1	10
9 How likely are you to recommend this website to someone else? (Recommend)	1	10

*All questions are scaled ``low'' to ``high''; e.g. for Reliability, 1 = not very reliable and 10 = very reliable.

Table 2 Comparison of Means and Tests of Difference

Variable	E-Government Mean SD *n*	E-Business Mean SD *n*	Difference	*t*-value	Statistically Significant at
Customization	7.279 2.06 2319	7.679 1.96 2483	–0.400	–6.895	0.000
Organization	7.484 1.90 2316	7.780 1.83 2464	–0.296	–5.486	0.000
Navigation	7.382 2.32 2317	7.704 1.85 2482	–0.322	–5.335	0.000
Reliability	8.166 1.76 2320	8.361 2.15 2284	–0.195	–3.370	0.001
Overall Satisfaction	7.391 2.43 2324	8.146 1.77 2486	–0.754	–12.346	0.000
Confirmation to Expectations	7.293 2.53 2324	7.169 2.16 2433	0.125	1.838	0.066
Comparison to Ideal	6.995 2.55 2324	7.449 2.04 2421	–0.454	–6.792	0.000
Retention	8.429 2.31 2324	8.027 2.34 2480	0.402	6.005	0.000
Recommend	7.982 2.61 2324	7.503 2.56 2444	0.479	6.386	0.000

On the other hand, and on a positive note for federal e-government, two variables found to be significantly different between the two groups favor federal Web sites. That is, while e-business Web site customers rate all of the determinants of satisfaction and two of the three satisfaction variables more favorably, the e-government Web site consumers give significantly higher ratings on the two outcome variables, indicating that they are significantly more likely than their e-business counterparts to both use the e-government Web site in the future and to recommend this Web site to someone else. While this is certainly positive news for the future of federal e-government—as this finding suggests that the government will actually be better able than the private sector to create customers loyal to this channel and draw in new customers through word-of-mouth recommendation—this outcome is somewhat anomalous. If e-government customers are less pleased with the services and generally less satisfied, why are they both more likely to reuse and to recommend to others? In the concluding section, we will offer some possible explanations for this finding.

While the foregoing analysis shows that federal e-government is, by and large, not yet performing up to the level of the private sector e-business Web sites, the nature of this underperformance is unclear. Are all federal e-government Web sites performing less well, or are some performing as well as e-business Web sites and others not? To answer this question, we further disaggregated the data to see how each individual Web site is performing, looking now only at the overall satisfaction variable.[5] As figure 1 shows, the ranges for low to high agency and low to high company Web sites differ considerably. For the individually measured e-business Web sites, the scores range from 7.9 to 8.7, or 0.8 on the 1–10 scale. By contrast, the individually measured e-government Web sites have scores that range from 6.6 to 8.2, or 1.6 on the 1–10 scale. In other words, the range for the federal e-government agency Web sites is about twice as large; overall satisfaction with individual e-government Web sites seems to vary significantly more.

To validate the findings that "eyeballing" this figure convey, tables 3, 4, and 5 provide results from Tukey's

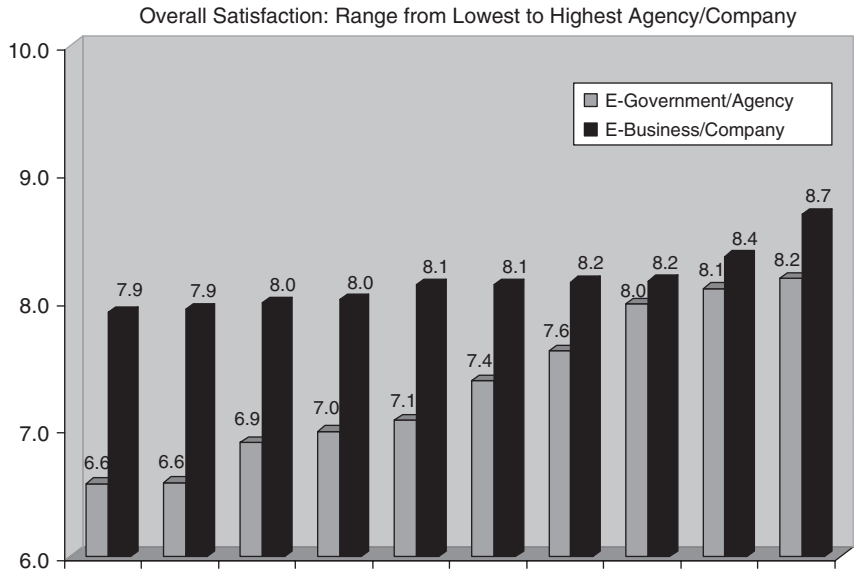

Figure 1

Table 3 Variance in Overall Satisfaction for E-Business/Company Websites

		Subset for alpha = .05	
Tukey HSD Test	N	2	1
MSNBC.com	247	7.907	
Ask.com	245	7.939	
ABCNews.com	247	7.992	
NYTimes.com	249	8.008	
AOL.com	249	8.133	
CNN.com	249	8.133	
USAToday.com	249	8.149	
MSN.com	251	8.163	
Yahoo.com	250	8.348	8.348
Google.com	250		8.676
Significance		0.140	0.545

Means for groups in homogeneous subsets are displayed
Tukey HSD uses a Harmonic Mean Sample Size

HSD (honestly significant difference) tests.[6] The Tukey's HSD test divides means into mutually exclusive groups, the "residents" of which *are not* significantly different from one another but *are* significantly different from all means not included in the group, at the .05 level. Using a more restrictive standard of significant difference which limits the risk of committing Type I errors, a risk that increases rapidly as a larger and larger number of individual *t* tests are performed, Tukey's HSD will allow us to get a better grasp on the extent and significance of the variability first within the e-business and e-government Web site groups, and then across all 20 of the individual Web sites considered collectively.

Looking first at table 3, the Tukey's HSD test shows that the means of the e-business Web sites can be broken into two groups. The first group contains 9 of the 10 measured e-business sites, excluding only Google.com. The second group contains only Google and Yahoo.com. In other words, only Google stands out in the industry, with significantly higher overall satisfaction than every Web site except Yahoo.com, and with the other nine Web sites receiving overall satisfaction scores that are not significantly different from one another. Remove Google, and none of the e-business Web sites would be differentiable from one another. Put simply, the e-business Web sites are very consistent in terms of how their customers rate them on overall satisfaction, with little variance across the e-business Web sites.

The same consistency certainly does not appear to exist within the group of e-government Web sites. As table 4 shows, the e-government Web sites occupy four separate groups, a result of the significantly larger variability within this overall group of individual Web sites. Whereas the e-business Web sites exhibit considerable stability in delivering overall satisfaction, federal e-government Web sites do not. Finally, comparing all 20 Web sites, table 5 shows the consequence of the larger variability across e-government Web sites. While table 5 indicates that the best of federal agency Web sites can "compete" on overall satisfaction with the best of the e-business Web sites, the very worst of the e-government Web sites (five in total, "E-Govt 1" through "E-Govt 5") are in a class all their own, significantly lower than *any* e-business Web site. It is these "worst performers" that are keeping e-government from, in the aggregate, providing the same level of overall satisfaction to customers.[7]

Table 4 Variance in Overall Satisfaction for E-Government/Agency Websites

				Subset for alpha = .05	
Tukey HSD Test	N	4	3	2	1
E-Govt 1	74	6.568			
E-Govt 2	250	6.580			
E-Govt 3	250	6.888	6.888		
E-Govt 4	250	6.976	6.976		
E-Govt 5	250	7.068	7.068		
E-Govt 6	250		7.384	7.384	
E-Govt 7	250		7.608	7.608	7.608
E-Govt 8	250			7.976	7.976
E-Govt 9	250			8.100	8.100
E-Govt 10	250				8.184
Significance		0.514	0.071	0.074	0.303

Table 5 Variance in Overall Satisfaction for E-Government/Agency and E-Business/Company Websites

							Subset for alpha = .05	
Tukey HSD Test	N	7	6	5	4	3	2	1
E-Govt 1	74	6.568						
E-Govt 2	250	6.580						
E-Govt 3	250	6.888	6.888					
E-Govt 4	250	6.976	6.976	6.976				
E-Govt 5	250	7.068	7.068	7.068				
E-Govt 6	250		7.384	7.384	7.384			
E-Govt 7	250			7.608	7.608	7.608		
MSNBC.com	247				7.907	7.907	7.907	
Ask.com	245				7.939	7.939	7.939	
E-Govt 8	250				7.976	7.976	7.976	
ABCNews.com	247				7.992	7.992	7.992	7.992
NYTimes.com	249				8.008	8.008	8.008	8.008
E-Govt 9	250					8.100	8.100	8.100
AOL.com	249					8.133	8.133	8.133
CNN.com	249					8.133	8.133	8.133
USAToday.com	249					8.149	8.149	8.149
MSN.com	251					8.163	8.163	8.163
E-Govt 10	250					8.184	8.184	8.184
Yahoo.com	250						8.348	8.348
Google.com	250							8.676
Significance		0.553	0.570	0.137	0.153	0.276	0.776	0.063

Discussion and Conclusion

The goal of this article has been to examine the success of the federal government's implementation of e-government from a comparative perspective, focusing specifically on the delivery of high-quality services through federal agency Web sites as compared to private sector e-business Web sites. Our analysis reveals two major findings.

First, we find that e-government as implemented at the federal level is not yet delivering high-quality services to citizens, at least when compared to e-business Web sites. By looking at Web site-level pairwise comparisons of means using Tukey's HSD tests, we find evidence for significantly greater variability across federal government Web sites. In other words, while some agencies' Web sites are offering services that rival

the private sector in satisfying customers, others are much further behind.

Expanding beyond what these data can tell us directly, several explanations provide clarity to the lagging performance of some e-government Web sites. It may be the case that the federal government simply has not had enough time to catch up to the private sector in offering high-quality Web sites, as often a considerable "organizational lag" exists in both the implementation and the mastery of new technologies—especially within government organizations (Damanpour and Evan 1984). Indeed, the E-Government Act seems to admit that such a lag existed very recently, and this assertion is supported by our analysis, although some agencies appear to be lagging more than others. It also seems to be the case that, generally speaking, IT departments within federal agencies are not nearly as well funded as their private sector counterparts. To take one example, for 2007, the Social Security Administration filed 12 Exhibit 300s with the Office of Management and Budget for new IT initiatives and systems enhancements (several of which deal mostly with telephony and not the Internet), and these projects were expected to cost approximately $605 million in total. In comparison, Google reported research and development expenditures of about $2.1 billion in 2007.

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It is also possible that the kind of interorganizational learning and system interoperability that are instrumental to organizational changes such as the adoption of e-government have proven difficult within a federal bureaucracy long recognized to suffer from functional silos detrimental to horizontal integration (Layne and Lee 2001; Mahler 2004). Perhaps most damningly, though, Fountain (2001) argues that the problem may be endemic to government and bureaucracy—that among public managers, a *disincentive* may exist for the successful deployment of IT.

> Ironically, the substantial efficiency gains driving the development of e-commerce and industry change are disincentives for bureaucrats to use the Internet in government. Whereas dramatic efficiency gains and cost savings in the economy are rewarded through profits… similar gains in government are rewarded with budget cuts, staff reductions, loss of resources, and consolidation of programs. (Fountain 2001, 13)

Second, while federal e-government Web sites lag e-business sites in basic measures of Web site functionality and satisfaction, they nevertheless are performing very well—in fact, superior to e-business Web sites—in the areas that could be seen to matter most, in getting customers to reuse and recommend these Web sites. One explanation for e-government's advantage on these measures may be a basic lack of alternatives; in other words, unlike the private sector, in many instances, a customer of a federal Web site has no choice but to remain loyal to that Web site, at least as long as he or she requires the services provided and no offline alternative exists. Additionally, a portion of this gap is likely explained by the one variable not fully discussed earlier, the confirmation to expectations variable.

The confirmation to expectations question, which asks the extent to which the Web site falls short of or exceeds prior expectations, was not found to be different enough across the two groups to reach the $p < .05$ level of significance utilized in the *t* tests, and thus the null hypothesis could not be safely rejected. However, the difference was very nearly significant *in favor of e-government Web sites,* and this finding is revealing in its own right. Even though federal Web sites lag in measures of functionality and service (customization, navigation, organization, and reliability), comparison to an ideal, and overall satisfaction, these customers still very nearly perceive e-government Web sites to more significantly exceed expectations than do customers of e-business Web sites. This finding would seem to indicate that customers come to their e-government experience with *significantly lower prior expectations* than those held by e-business customers.[8] In turn, e-government customers are (or nearly are) more pleased with the experience in relation to their own lower expectations—that is, they have their lower expectations positively disconfirmed to a larger extent (Olshavsky and Miller 1972). And because these expectations are in all likelihood formed relative to their previous experiences with traditional and less satisfying *offline federal services,* e-government customers are more likely to both speak positively about the experience to others and return in the future than are e-business customers (Fornell 2005).

We note some implications arising from our findings that should be considered by federal agencies as they continue to develop their IT and e-government systems. First, our research suggests that agencies involved in the development and deployment of e-government Web sites must heed the advice of advocates of New Public Management and rigorously *measure the performance* of their Web sites. While our study has shown that there are some positive elements in the early returns from customers

of e-government, there is also considerable room for improvement and hurdles to overcome in implementing this technology (Holmes 2006). As the old axiom says, "what gets measured gets done," and governments must follow the lead of the private sector here as well and carefully monitor the performance of market-inspired reforms such as e-government. Some recent research has found, however, that in some contexts, government performance remains largely ignored and unmeasured (even where explicitly mandated), and furthermore, even where it is measured, the results are not put to meaningful use (Poister and Streib 1999). Yet if the goal of federal e-government is truly to provide the kind of citizen-centric government promised in legislation such as the E-Government Act, systems of performance measurement, self-critically seeking the aspects of agency Web sites that are and are not providing high-quality customer service, must be implemented and taken seriously, with results from these studies integrated into agency IT development, budgeting and decision-making processes (Osborne and Plastrik 2000).

> … our research suggests that agencies involved in the development and deployment of e-government Web sites must … rigorously *measure the performance* of their Web sites.

In addition to a call for performance measurement of e-government, this study also offers some guidance regarding one common means for assessing performance, *performance benchmarking* (Keehley 1997). Performance benchmarking, which aims "to identify competitive targets which render the weak points of the benchmarking organization visible and to establish means of improvement," has increasingly been viewed as an essential practice for government (Kouzmin et al. 1999, 123). Our findings seem to support the idea that federal agency IT departments, through benchmarking, can learn much from their private sector counterparts, specifically how to design and deploy Web sites deemed high quality and satisfying. How are companies designing e-business Web sites that are viewed as both more customized to individual user needs and better organized? How are these companies designing Web sites that are both easier to navigate and more reliable? More specifically, where do the critical differences lie between the two types of Web sites that explain the lower performance of e-government in these areas? Moreover, how feasible is it for federal agencies to imitate some or all of the positive characteristics that have set e-business apart in transforming their own Web sites toward greater quality and satisfaction of end users? While certainly not comprehensive, this list of questions provides a good start for agencies as they benchmark and seek private sector best practices for improving their own Web sites.

Notes

1. While a good start, we do not rule out other possibilities or arguments regarding a test of e-government performance. For instance, a finer-grained comparison of public and private sector transactional Web sites—given the importance of this particular subset of e-government Web sites for producing both efficiency gains and improvements in service quality—is one alternative research design worthy of consideration, and one that might also provide a more direct type of comparison (see Eschenfelder and Miller 2007 for a discussion). Others might challenge the comparability of e-government and e-business at any level, given the fundamentally different natures of these two domains, as outlined in the introduction. Indeed, the similarities between "customers" and "citizens" only go so deep, and it is reasonable to assert that these two groups of consumers bring with them highly divergent pre-experience expectations—a determinant of service quality that is receiving more attention of late vis-à-vis government services (Chadwick and May 2003; Eschenfelder and Miller 2007; James 2009).
2. Some might argue that the real position of proponents of New Public Management is that government could perform better than it does now if it adopted private sector practices such as e-government, not that it will perform as well as the private sector, and that our study is therefore biased prima facie against e-government. Following this logic, it would be best to compare online and "offline," or traditional, federal government services to determine e-government's success. We offer two responses to this objection: First, many do in fact claim that government could perform as well as the private sector, and not just "a little better" than now, on the basis of these transformations. Second, and more importantly, whether one adopts the "better than now" or the "as well as" position, private sector e-business remains a very useful benchmark for judging the success of federal e-government, the standard to which e-government ought to aspire, and thus remains a fair and useful comparison.
3. Additional information about the ACSI, including its history, the organizations involved in its production, and the full range of sectors, industries, and companies measured can be found at: http://www.theacsi.org.
4. Given the focus of this study and the nature of the disaggregated item-level data that we use (see Poister and Henry 1994 for a similar approach), issues related to reliability and discriminant validity do not apply. Such issues would arise if we were to perform

some form of aggregation using factor analysis and/or structural equation modeling.

5. It is reasonable to look at the overall satisfaction question here, because looking at all of the variables in this type of analysis would be very cumbersome, because this variable best expresses (theoretically) the sum total of the end users' experience with the Web site, and because this variable exhibits the largest absolute difference in users' perceptions of e-government and e-business Web sites. It should be noted that identical analyses across all of the variables, at least those where e-government is performing significantly worse, show very similar results.
6. Tukey's HSD performs pairwise comparisons of all of the means in a group, while controlling for the familywise Type I error rate with a preset alpha, and still maintaining a high level of power. Tukey's HSD uses the studentized range statistic as a critical value, and groups the means based on nonsignificant differences (at alpha = .05) (Sheskin 2004).
7. In addition to the foregoing analysis, we conducted supplemental tests to lend further support to our conclusion that federal e-government currently underperforms the private sector, and to rule out the possibility that the results presented above are solely the product of the sample chosen. This analysis utilized satisfaction data for all of the federal Web sites measured by the ACSI in 2005 and 2006, a total of 665 independent Web site measures. We compared these data with ACSI e-business data for 2005 and 2006, and with a broader sample of private sector Web sites which included e-commerce Web sites (Web sites focused on economic transactions, such as Amazon.com, Ebay.com, and so forth). While we do not present the results here, all of these data are publicly available and can be accessed online at http://www.theacsi.org. Utilizing these data, we find that the aggregate of e-government Web sites score significantly lower than e-business Web sites and perform even worse when compared to e-commerce Web sites and the combined sample of e-business and e-commerce Web sites. Further, we again discovered a larger standard deviation for the e-government Web sites, illustrating the greater variance intrinsic to this category.
8. Unfortunately, while data for pre-experience expectations do exist for the e-business study, they do not exist for the e-government study, and thus we cannot be certain that prior expectations of e-government are indeed lower. However, the existing data would seem to support this interpretation.

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